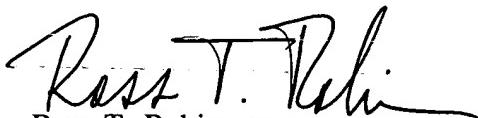


It is submitted that no new matter has been added. A marked-up copy of all pending claims after the amendments made herein is attached to this Preliminary Amendment as Exhibit A. A marked-up copy of all amendments to the specification is attached to this Preliminary Amendment as Exhibit B. A marked-up copy of the Abstract is attached as Exhibit C.

In view of the foregoing, Applicant respectfully requests the thorough and complete examination of this application and earnestly solicits an early notice of allowance.

Respectfully submitted,

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Exhibit A

1. (AMENDED) A method for controlling a data unit oriented communication between a sender and a receiver operating in accordance with a predetermined communication protocol, [where]comprising:

[said sender divides] dividing, by the sender, of an amount of data to be sent into [one or more] at least one data [units]unit having a structure determined by [said] the protocol[,];

[said receiver acknowledges] acknowledging, by the receiver, of[the] correct receipt of data units by returning acknowledgment data units to [said] the sender[,];

sending, by the sender, of [said] the data units [are sent by said sender]in accordance with a flow control procedure conducted on the basis of [one or more]at least one adaptive [parameters]parameter and[said] the acknowledgment data units[,]; [and]

wherein [said] the flow control procedure comprises a data loss detection mechanism capable of detecting data loss in [said] the communication[,];

wherein [said] the data loss detection mechanism [being] is triggered to indicate the potential loss of data by-[one or more]at least one predetermined event[events,];

[where]wherein, in response to the triggering of [said] the data loss detection mechanism, a corresponding response procedure is conducted[,]; and

wherein [said] the response procedure [comprising] comprises at least two different modes for adapting [said] the [one or more]at least one adaptive [parameters]parameter.

2. (AMENDED) [A] The method [according to] of claim 1, wherein: [said] the data loss detection mechanism [is]comprises a time out mechanism[, such that] after a data unit is sent, [said]the sender monitors a time out period, and, if no acknowledgment data unit associated with [said] the data unit is received before [said] the time out period expires, [said] the time out mechanism is triggered.

3. (AMENDED) [A] The method [according to] of claim 1, wherein: [said] the data loss detection mechanism [is]comprises a duplicate acknowledgment detection mechanism[, such that said]

the sender monitors the received acknowledgments, and;
if a data unit is acknowledged a predetermined number of times, [said] the duplicate
acknowledgment detection mechanism is triggered.

4. (AMENDED) [A] The method [according to] of claim 2[or 3], wherein [said] the
response procedure comprises the retransmission of a given data unit.

5. (AMENDED) [A] The method [according to] of claim 4, wherein the decision on
which of [said] the at least two modes to choose for adapting [said] the adaptive parameters is
made on the basis of [one or more] at least one acknowledgment data [units]unit received by
[said] the sender after having retransmitted [said] the given data unit.

6. (AMENDED) [A] The method [according to] of claim 2, wherein [said] the time out
period [is] comprises one of [said] the adaptive parameters.

7. (AMENDED) [A] The method [according to] of [one of claims 1 to 6] claim 1,
wherein [said] the flow control procedure is window based[,] and [one or more] at least one
flow control [windows]window is [are] among [said] the adaptive parameters.

8. (AMENDED) [A] The method [according to] of claim 5, wherein: [said]
the at least two modes consist of a first and a second mode, [said] the first mode being
associated with [the]a judgment that the triggering event was caused by the loss of [said] the
given data unit[,]; and [said]
the second mode [being]is associated with [the]at least one of a judgment that [said]
the given data unit [or the] and a judgment that the acknowledgment data unit for [said] the
given data unit has been excessively delayed.

9. (AMENDED) [A] The method [according to] of claim 8, wherein:
[said] the sender marks data units being sent such that an original transmission
[may]can be distinguished from a retransmission[,]; and

[said] the receiver correspondingly marks the acknowledgment data units, such that the acknowledgment of an originally sent data unit [may] can be distinguished from the acknowledgment of the retransmission of [said] the data unit.

10. (AMENDED) [A] The method [according to] of claim 9, wherein:
the sender marks data units by including a time stamp in each sent data unit, [said] the time stamp indicating the time [said] the data unit was sent[,]; and

the receiver marks the acknowledgment data unit for a received data unit by including the time stamp contained in [said] the received data unit in the acknowledgment data unit for [said] the received data unit.

11. (AMENDED) [A] The method [according to] of claim 9, wherein:
the sender marks data units by including a bit string in each sent data unit, [said] the bit string having at least two different values for distinguishing between an original transmission and a retransmission[,]; and

the receiver marks the acknowledgment data unit for a received data unit by including the bit string contained in [said] the received data unit in the acknowledgment data unit for [said] the received data unit.

12. (AMENDED) [A] The method [according to] of claim 11, wherein [said] the bit string consists of a single bit.

13. (AMENDED) [A] The method [according to] of claim 11, wherein [said] the bit string consists of a plurality of bits, such that [said] the bit string is capable of distinguishing between different retransmissions.

14. (AMENDED) [A] The method [according to] of [one of claims] claim 10[to 13], wherein:

[said] the first mode is chosen if the first acknowledgment data unit associated with [said] the given data unit [that is] received after having retransmitted [said] the given data unit acknowledges the retransmission of [said] the given data unit[,]; and

[said] the second mode is chosen if the first acknowledgment data unit associated with [said] the given data unit [that is]received after having retransmitted [said] the given data unit acknowledges the original transmission of [said] the given data unit.

15. (AMENDED) [A] The method [according to] of claim 8, wherein:
the sender measures the round trip time associated with the connection for sending of [said] the amount of data[,];

the time between the retransmission of [said] the given data unit and the receipt of the first acknowledgment data unit associated with [said] the given data unit is determined and compared to a value derived from [one or more] at least one of [said] the round trip time measurements[,]; and

[said] the first or second mode is chosen on the basis of the result of [said] the comparison.

16. (AMENDED) [A] The method [according to] of claim 15, wherein:
[said] the value derived from [said] the round trip time measurements is the shortest round trip time for the connection[,]; and

the second mode is chosen if [said] the time between the retransmission of [said] the given data unit and the receipt of the first acknowledgment data unit associated with [said] the given data unit is smaller than a predetermined fraction of [said] the smallest round trip time.

17. (AMENDED) [A] The method [according to] of [one of claims] claim 8[to 16], wherein the second mode comprises adapting the time out period on the basis of the time that elapsed between the original transmission of [said] the given data unit and [the]receipt of the first acknowledgment data unit associated with [said] the given data unit.

18. (AMENDED) [A] The method [according to] of [one of claims] claim 8[to 17],
wherein:

the flow control procedure is window based and a congestion window is used[,];
[where]

the value of [said] the congestion window at the time of [said] the triggering event is stored after [said] the [triggereing] triggering event occurred and subsequently [said] the value of the congestion window is reset to a predetermined value[,]; and

if [said] the second mode is chosen after having received the first acknowledgment data unit associated with [said] the given data unit, [said] the value of [said] the congestion window is set to the value it would have assumed, had the response procedure not taken place.

19. (AMENDED) A communication device for data unit oriented communication in accordance with a predetermined communication protocol, [where] wherein: [said]

the communication protocol prescribes that [the]a sender in a communication divides an amount of data to be sent into [one or more] at least one data [units]unit having a structure determined by [said] the protocol and [the] a receiver in [said] the communication acknowledges the correct receipt of data units by returning acknowledgment data units to the sender[,];

[where said] the communication device, when acting as [a]the sender, is arranged to send data units in accordance with a flow control procedure [that is]conducted on the basis of [one or more] at least one adaptive [parameters]parameter and [said] the acknowledgment data units[,];

[said] the flow control procedure [comprising]comprises a data loss detection mechanism capable of detecting data loss in [said] the communication[,];

[said] the data loss detection mechanism [being]is triggered to indicate [the]potential loss of data by [one or more] at least one predetermined [events]event; and[,]

[where] in response to the triggering of [said] the data loss detection mechanism, a corresponding response procedure is conducted, [said] the response procedure comprising at

least two different modes for adapting [said] the [one or more] at least one adaptive [parameters]parameter.

20. (AMENDED) [A] The device [according to] of claim 19, wherein [said] the data loss detection mechanism [is] comprises a time out mechanism, such that after a data unit is sent, [said] the device, when acting as [a]the sender, monitors a time out period and, if no acknowledgment data unit associated with [said] the data unit is received before [said] the time out period expires, [said] the time out mechanism is triggered.

21. (AMENDED) [A] The device [according to] of claim 19, wherein [said] the data loss detection mechanism [is] comprises a duplicate acknowledgment detection mechanism, such that [said] the device, when acting as [a]the sender, monitors the received acknowledgments[,], and, if a data unit is acknowledged a predetermined number of times, [said] the duplicate acknowledgment detection mechanism is triggered.

22. (AMENDED) [A] The device [according to] of [one of claims] claim 19[to 21], wherein [said] the response procedure comprises [the]retransmission of a given data unit.

23. (AMENDED) [A] The device [according to] of claim 22, wherein the decision [on]of which of [said] the at least two modes to choose for adapting [said] the adaptive parameters is made on the basis of [one or more] at least one acknowledgment data [units]unit received by [said] the sender after having retransmitted [said] the given data unit.

24. (AMENDED) [A] The device [according to] of claim 20, wherein [said] the time out period [is] comprises one of [said] the adaptive parameters.

25. (AMENDED) [A] The device [according to] of [one of claims] claim 19[to 24], wherein [said] the flow control procedure is window based, and [one or more] at least one flow control [windows are]window is among [said] the adaptive parameters.

26. (AMENDED) [A]The device [according to] of claim 23, wherein [said] the at least two modes consist of a first and a second mode, [said] the first mode being associated with [the]judgment that the triggering event was caused by the loss of [said] the given data unit, and [said] the second mode being associated with [the]at least one of a judgment that [said] the given data unit [or the]and a judgment that an acknowledgment data unit for [said] the given data unit has been excessively delayed.

27. (AMENDED) [A] The device [according to] of claim 26, wherein:
[said] the device, when acting as [a]the sender, marks data units being sent such that an original transmission [may]can be distinguished from a retransmission[,]; and
[said] the device, when acting as a receiver, correspondingly marks the acknowledgment data units, such that the acknowledgment of an originally sent data unit may be distinguished from the acknowledgment of the retransmission of [said] the data unit.

28. (AMENDED) [A] The device [according to] of claim 27, wherein:
the device, when acting as [a]the sender, marks data units by including a time stamp in each sent data unit[,] [said]the time stamp [indicating]indicates the time [said] the data unit was sent[,]; and
the device, when acting as a receiver, marks the acknowledgment data unit for a received data unit by including the time stamp contained in [said] the received data unit in the acknowledgment data unit for [said] the received data unit.

29. (AMENDED) [A] The device [according to] of claim 27, wherein:
the device, when acting as [a]the sender, marks data units by including a bit string in each sent data unit[,], [said]the bit string [having]has at least two different values for distinguishing between an original transmission and a retransmission[,]; and
the device, when acting as a receiver, marks the acknowledgment data unit for a received data unit by including the bit string contained in [said] the received data unit in the acknowledgment data unit for [said] the received data unit.

30. (AMENDED) [A] The device [according to] of claim 28[or 29], wherein:
[said] the first mode is chosen if the first acknowledgment data unit associated with
[said] the given data unit [that is]received after having retransmitted [said] the given data unit
acknowledges the retransmission of [said] the given data unit[,]; and

[said] the second mode is chosen if the first acknowledgment data unit associated with
[said] the given data unit [that is]received after having retransmitted [said] the given data unit
acknowledges the original transmission of [said] the given data unit.

31. (AMENDED) [A] The device [according to] of claim 26, wherein:
the device, when acting as [a]the sender, measures the round trip time associated with
the connection for sending of [said] the amount of data[,];

the time between the retransmission of [said] the given data unit and the receipt of the
first acknowledgment data unit associated with [said] the given data unit is determined and
compared to a value derived from [one or more] at least one of [said] the round trip time
measurements[,]; and

[said] the first or second mode is chosen on the basis of the result of [said] the
comparison.

32. (AMENDED) [A] The device [according to] of claim 31, wherein:
[said] the value derived from [said] the round trip time measurements [is] comprises
the shortest round trip time for the connection[,]; and

the second mode is chosen if [said] the time between the retransmission of [said] the
given data unit and the receipt of the first acknowledgment data unit associated with [said] the
given data unit is smaller than a predetermined fraction of [said] the smallest round trip time.

33. (AMENDED) [A] The device [according to] of [one of claims]claim 26[to 32],
wherein the second mode comprises adapting the time out period on the basis of the time that
elapsed between the original transmission of [said] the given data unit and the receipt of the
first acknowledgment data unit associated with [said] the given data unit.

34. (AMENDED) [A] The device [according to] of [one of claims] claim 26[to 33],
wherein:

the flow control procedure is window based and a congestion window is used[,];

[where]the value of [said] the congestion window at the time of [said] the triggering event is stored after [said] the triggering event occurred and subsequently [said] the value of the congestion window is reset to a predetermined value[,]; and

if [said] the second mode is chosen after having received the first acknowledgment data unit associated with [said] the given data unit, [said] the value of [said] the congestion window is set to the value it would have assumed, had the response procedure not taken place.



Exhibit B

Please replace the paragraph at p. 5, lns. 28-33, with the following paragraph:

It is [the] an object of embodiments of the present invention to improve the communication in a system using a communications protocol that specifies the acknowledgment of sent data and specifies a data loss detection function, such as a time-out function or a duplicate acknowledgment response function.

Please remove the paragraph at p. 5, lns. 35-36.

[This object is solved by a method as described in claim 1 and a device as described in claim 18.]

Please replace the paragraph at p. 6, lns. 1-15, with the following paragraph:

In accordance with embodiments of the present invention, a sender in a communication will conduct a response procedure in response to an event that triggers a data loss detection mechanism, where the response procedure comprises at least two different modes for adapting the adaptive parameters used in flow control. In this way the method and device of the present invention are highly flexible in their management of triggering events, and can especially be implemented in such a way that the response procedure may be chosen depending on various potential causes of the triggering event, such that the correct responsive measures to a given situation may be invoked, and thereby measures can be avoided that might actually aggravate situations that may occur after a data loss detection mechanism was triggered.

Please replace the paragraph at p. 6, ln. 23- pg. 7, ln. 16, with the following paragraph:

According to embodiments of the present invention, a response procedure comprises at least two different modes for adapting the adaptive parameters used in flow control. As an example, which constitutes a preferred embodiment, there are two modes, which are respectively associated with different causes of a time-out or a predetermined number of duplicate acknowledgments (e.g. the above mentioned 3). More specifically, a first mode is associated with the loss of a data unit, and the second mode is associated with an excessive delay along the connection. Due to the use of two different modes, it is possible to adapt the parameters as is appropriate for the cause of the time-out or duplicate acknowledgments. Accordingly, the flow control procedure will contain one or more evaluation and judgment steps, in which the triggering event is qualified, e.g. a categorization is conducted as to what caused the event. Then, depending on the result of this characterization, an appropriate response procedure may be enabled. In the context of the above example, if it is determined that the time-out or duplicate acknowledgments are caused by the loss of a data unit, then the known response procedure to the loss of data units may be run, as it is e.g. known from conventional TCP, which assumes that any time-out or the receipt of several duplicate acknowledgments is caused by the loss of a data unit. In accordance with the present embodiment, there is however a second mode, and if it is determined that the time-out or duplicate acknowledgments are caused by an excessive delay along the connection, then an excessive delay response procedure is run, which will typically be different from the response procedure to the loss of a data unit.

Please replace the paragraph at p. 8, lns. 9-12, with the following paragraph:

Further aspects and advantages of embodiments of the present invention shall be better understood from the following detailed description, which makes reference to the figures, in which:

Please replace the paragraph at p. 8, lns. 14-15, with the following paragraph:

- Fig. 1 shows a preferred embodiment of [the] a control procedure

Please replace the paragraph at p. 17, lns. 1-6, with the following paragraph:

Although embodiments of the present invention [has] have been described in connection with preferred embodiments, these do not restrict the scope, and are only intended to convey a better understanding of the invention. Much rather, the scope of the invention is determined by the appended claims.



Exhibit C

IN THE ABSTRACT

Please remove the paragraph at p. 28, ln. 30.

[Fig. 1].